

I claim:

1 1. An electronic clutch assembly for a lock system, the lock
2 system having a latch and first and second rotatable spindles,
3 one of the two spindles being operatively connected with the
4 latch to displace the latch between first and second latch
5 positions, the clutch assembly comprising:
6 a clutch coupled with the first spindle and having a
7 connective portion engageable with the second spindle, the
8 clutch being linearly displaceable along a first axis between a
9 first position in which the connective portion is nonengaged
10 with the second spindle and a second position in which the
11 connective portion is engaged with the second spindle;
12 a cam displaceable generally along a second axis, the
13 second axis extending generally perpendicularly with respect to
14 the first axis, and configured to linearly displace the clutch
15 between the first and second clutch positions; and
16 an electric actuator operatively connected with the cam and
17 configured to linearly displace the cam along the second axis
18 such that the clutch alternatively couples the second spindle
19 with the first spindle and uncouples the second spindle from the
20 first spindle.

1 2. The clutch assembly as recited in claim 1 wherein the first
2 spindle is operatively connected with the latch, the second
3 spindle is freely rotatable when the clutch is disposed in the
4 first clutch position and the rotation of the second spindle
5 rotatably displaces the first spindle when the clutch is
6 disposed in the second clutch position.

1 3. The clutch assembly as recited in claim 1 wherein the first
2 spindle is operatively connected with the latch and the second

3 spindle is rotatable about the first axis while the first
4 spindle remains generally stationary with respect to the first
5 axis when the clutch is disposed in the first clutch position.

1 4. The clutch assembly as recited in claim 1 wherein the first
2 spindle is operatively connected with the latch, the first and
3 second spindles are each rotatable about the first axis, and the
4 two spindles and the clutch rotate as a single unit about the
5 first axis to displace the latch between the first and second
6 latch positions when the clutch is disposed in the second clutch
7 position.

1 5. The clutch assembly as recited in claim 1 wherein the
2 clutch has an outer contact surface and the cam has a camming
3 surface contactable with the clutch contact surface such that
4 when the cam displaces along the second axis, the camming
5 surface slides against the contact surface so as to displace the
6 clutch between the first and second clutch positions.

1 6. The clutch assembly as recited in claim 1 wherein:
2 the clutch includes a conical body portion extending
3 circumferentially and at least partially about the first axis,
4 the conical portion having an angled contact surface extending
5 between a first, most proximal position with respect to the
6 first axis and a second, most distal position with respect to
7 the first axis; and

8 the cam includes a generally wedge-shaped body portion, the
9 wedge-shaped portion having an camming surface contactable with
10 the clutch contact surface such that when the cam displaces
11 along the second axis in a first direction generally toward the
12 first axis, the camming surface slides against the clutch

13 contact surface so as to displace the clutch from the first
14 clutch position to the second clutch position.

1 7. The clutch assembly as recited in claim 6 further
2 comprising a biasing member configured to displace the clutch
3 from the second clutch position to the first clutch position
4 when the cam displaces along the second axis in a second
5 direction generally away from the first axis.

1 8. The clutch assembly as recited in claim 1 wherein one of
2 the first spindle and the clutch has an opening and the other
3 one of the first spindle and the clutch has a coupler portion
4 slidably disposed at least partially within the opening so as to
5 operatively connect the clutch with the first spindle.

1 9. The clutch assembly as recited in claim 1 further
2 comprising a biasing member operatively connected with the
3 clutch and configured to displace the clutch from the second
4 clutch position and toward the first clutch position.

1 10. The clutch assembly as recited in claim 1 wherein the lock
2 system further includes a housing having first and second
3 openings and an interior space, the first spindle is rotatably
4 disposed within the first housing opening, the second spindle is
5 rotatably disposed within the second housing opening, and the
6 clutch, the cam and the actuator are each disposed within the
7 interior space.

1 11. The clutch assembly as recited in claim 1 wherein the first
2 spindle is operatively connected with the latch and the second
3 spindle has a handle portion configured for manual rotation of
4 the second spindle, such that when the clutch is disposed in the

5 second clutch position, manual rotation of the handle portion
6 rotatably displaces the first spindle so as to displace the
7 latch between the first and second latch positions.

1 12. The clutch assembly as recited in claim 1 further
2 comprising:
3 an input device configured to generate a control signal;
4 and
5 a logic circuit electrically connected with the input
6 device and with the actuator, the logic circuit being configured
7 to receive the control signal and to operate the actuator so as
8 to displace the cam in response to the control signal.

1 13. The clutch assembly as recited in claim 1 wherein each one
2 of the first and second spindles has an opening and the clutch
3 includes a first shaft portion slidably disposed in the first
4 spindle opening so as to couple the clutch with the first
5 spindle and a second shaft portion slidably disposeable within
6 the second spindle opening so as to releasably engage with the
7 second spindle.

1 14. The clutch assembly as recited in claim 1 wherein the
2 electric actuator is a motor having a rotatable shaft, the shaft
3 being operably connected with the cam such that rotation of the
4 shaft in a first direction displaces the cam generally toward
5 the first axis and rotation of the shaft in a second direction
6 displaces the cam generally away from the first axis.

1 15. An actuator assembly for a lockset including a latch
2 movable between first and second positions, the actuator
3 assembly comprising:

4 a rotatable output member configured to displace the latch
5 between the first and second latch positions;
6 a rotatable input member configured for manual rotation;
7 a clutch coupled with the output member and having a
8 connective portion engageable with the input member, the clutch
9 being linearly displaceable along a first axis between a first
10 position in which the connective portion is nonengaged with the
11 input member and a second position in which the connective
12 portion is engaged with the input member; and
13 a mechanism operatively connected with the clutch and
14 configured to linearly displace the clutch along the first axis
15 between the first and second clutch positions such that the
16 clutch alternatively operatively couples the input member with
17 the latch and uncouples the input member from the latch.

1 16. The actuator assembly as recited in claim 15 wherein the
2 mechanism includes:

3 a cam displaceable generally along a second axis, the
4 second axis extending generally perpendicularly with respect to
5 the first axis, and configured to linearly displace the clutch
6 between the first and second clutch positions; and

7 an electric actuator operatively connected with the cam and
8 configured to linearly displace the cam along the second axis.

1 17. The actuator assembly as recited in claim 16 wherein the
2 clutch has an outer contact surface and the cam has a camming
3 surface contactable with the clutch contact surface such that
4 when the cam displaces along the second axis, the camming
5 surface slides against the contact surface so as to displace the
6 clutch between the first and second clutch positions.

1 18. The actuator assembly as recited in claim 15 wherein:
2 the input member is rotatable about the first axis while
3 the output member remains generally stationary with respect to
4 the first axis when the clutch is disposed in the first clutch
5 position; and
6 the input and output members are each rotatable about the
7 first axis as a single unit to displace the latch between the
8 first and second latch positions when the clutch is disposed in
9 the second clutch position.

1 19. The actuator assembly as recited in claim 15 further
2 comprising:
3 an input device configured to generate a control signal;
4 and
5 a logic circuit electrically connected with the input
6 device and with the actuator, the logic circuit being configured
7 to receive the control signal and to operate the mechanism
8 actuator so as to displace the clutch in response to the control
9 signal.

1 20. The actuator assembly as recited in claim 15 further
2 comprising a biasing member operatively connected with the
3 clutch and configured to displace the clutch from the second
4 clutch position and toward the first clutch position.

1 21. A shield device for a fastener of a lock assembly, the lock
2 assembly being adjustable between an inoperable state and an
3 operable state, the shield device comprising:
4 a barrier displaceable between a first position at which
5 the barrier at least partially covers the fastener and a second
6 position at which the fastener is generally accessible, the
7 barrier being disposed in the first position when the lock

8 assembly is arranged in the inoperable state and being disposed
9 in the second position when the lock assembly is arranged in the
10 operable state.

1 22. The shield device as recited in claim 21 wherein the lock
2 assembly includes a member configured to adjust the lock
3 assembly between the operable and inoperable states, the barrier
4 being coupled with the member such that when the lock member
5 adjusts the lock assembly between the operable and inoperable
6 states, the barrier displaces between the first and second
7 positions.

1 23. A shield device for a fastener of a lock assembly, the
2 fastener having a head and being removably engageable with a
3 door so as to connect the lock assembly with the door, the lock
4 assembly further including a housing, the shield device
5 comprising:
6 a barrier movably disposed within the housing and
7 displaceable between a first position at which the barrier at
8 least partially covers the fastener head so as to prevent
9 removal of the fastener from the door and a second position at
10 which the fastener head is generally accessible so as to permit
11 removal of the fastener from the door.

1 24. The shield device as recited in claim 23 wherein the
2 fastener head is engageable by a tool and the barrier is
3 configured to prevent engagement of the tool with the fastener
4 head when the barrier is located in the first position.

1 25. The shield device as recited in claim 21 wherein the lock
2 assembly further includes a member movable between a first
3 position and a second position, the barrier being coupled with

4 the lock member such that movement of the lock member between
5 the lock member first and second positions displaces the barrier
6 between the barrier first and second positions.

1 26. The shield device as recited in claim 25 further comprising
2 a link having a first end connected with the lock member and a
3 second end connected with the barrier, wherein movement of the
4 lock member displaces the link such that the link displaces the
5 barrier.

1 27. The shield device as recited in claim 26 wherein the link
2 includes an elongated body and the barrier includes a plate
3 attached to the body.

1 28. The shield device as recited in claim 25 wherein the lock
2 assembly is disposeable in a first, operable state and
3 alternatively disposeable in a second, inoperable state, the
4 lock member is configured to adjust the lock assembly between
5 the operable and inoperable states, and the barrier is
6 configured to prevent access to the fastener when the lock is
7 disposed in the inoperable state and to permit access to
8 fastener when the lock assembly is disposed in the operable
9 state.

1 29. The shield device as recited in claim 25 wherein:
2 the lock assembly includes a latch engageable with a strike
3 and a handle operatively coupleable with the latch so as to move
4 the latch between a locked position and an unlocked position;
5 the lock member is configured to couple the latch with a
6 handle when disposed in the lock member second position, the
7 handle being noncoupled with the latch when the lock member is
8 disposed in the lock member first position; and

9 the fastener is removable from the door when the lock
10 member couples the handle with the latch.

1 30. The shield device as recited in claim 23 wherein the lock
2 housing has an opening, the opening being generally aligned with
3 the fastener head such that the fastener head is generally
4 accessible through the opening, and the barrier is disposed
5 generally between the opening and the fastener head when located
6 in the barrier first position.

1 31. The shield device as recited in claim 30 wherein a tool is
2 insertable into the housing through the opening to engage with
3 the fastener, the barrier preventing engagement of the tool with
4 the fastener when disposed in the barrier first position.

1 32. The shield device as recited in claim 23 wherein the
2 fastener is configured to mount the housing to one a door and a
3 door frame.

1 33. The shield device as recited in claim 23 wherein the lock
2 assembly is connectable with a door, the housing includes a base
3 wall disposeable against the door, the fastener is extendable
4 through the base wall and into the door so as to mount the
5 housing to the door, the barrier preventing removal of the
6 fastener from the door when disposed in the barrier first
7 position.

1 34. The shield device as recited in claim 23 wherein the
2 barrier has opposing surfaces and an access opening extending
3 between the surfaces, the access opening located on the barrier
4 so as to be generally aligned with the fastener when the barrier

5 is located in the first barrier position such that the fastener
6 is access.

1 35. The shield device as recited in claim 23 further comprising
2 means for displacing the barrier between the first and second
3 positions.

1 36. A shield device for preventing access to a fastener of a
2 lock assembly, the fastener having a head and the lock assembly
3 further including a member movable between first and second
4 positions, the shield device comprising:
5 a barrier displaceable between a first position at which
6 the barrier at least partially covers the fastener head and a
7 second position at which the fastener head is generally
8 accessible, the barrier being coupled with the lock member such
9 that the barrier displaces from the barrier first and second
10 positions when the lock member displaces between the lock member
11 first and second positions.

1 37. A shield device for preventing access to a fastener of a
2 lock assembly, the shield device comprising:
3 a barrier displaceable between a first position at which
4 the barrier at least partially covers the fastener and a second
5 position at which the barrier is spaced from the fastener such
6 that the fastener is generally accessible; and
7 means for displacing the barrier between the first and
8 second positions.